



Weatherford®

DOC NO:	5-6-GL-GL-CAE-00003
DOC NAME:	Dog Leg Severity
REVISION NO:	02
DATE REVISED:	June 2014
AUTHOR:	rbarker
APPROVED BY:	Ron Barker

Dog Leg Severity Comparison Chart

Casing Exit System	CASING				Liner OD (Flush Joint)		Calculated DLS	Radius of Curvature	
	Size		Weight						
	(in.)	(mm)	(lb)	(kg)	(in.)	(mm)		(100 ft)	(ft)
QuickCut™	4-1/2	114.3	11.6	5.3	2.88	73.0	23.20	248	75.6
QuickCut	5	127	18.0	8.1	2.875	73.0	21.40	268	81.7
QuickCut	5-1/2	139.7	17.0	7.7	4.00	101.6	19.50	293	89.3
QuickCut	5-1/2	139.7	23.0	10.4	4.000	101.6	19.50	288	87.8
QuickCut	5-3/4	146.1	17.6	26.2	4.000	101.6	15.2	378	115.2
QuickCut	6-5/8	168.3	32.0	14.5	4.500	114.3	16.03	358	109.1
QuickCut	7	177.8	26.0	11.8	5.50	139.7	15.20	378	115.2
QuickCut	7	177.8	35.0	15.9	5.00	127.0	14.47	396	120.7
QuickCut	7-5/8	193.7	29.7	13.5	5.500	139.7	13.00	377	114.9
QuickCut	7-5/8	193.7	39.0	17.7	5.500	139.7	13.40	427	130.1
QuickCut	8-5/8	219.3	24	10.9	7	177.8	14.60	392	119.4
QuickCut	8-5/8	219.3	38	17.2	6	152.4	10.20	562	171.2
QuickCut	9-5/8	244.5	40.0	18.1	7.000	177.8	10.20	560	170.7
QuickCut	9-5/8	244.5	53.5	24.3	7.000	177.8	10.30	558	170.1
QuickCut	13-3/8	339.7	72.0	32.7	11.500	292.1	14.3	402	122.5
QuickCut	16	406.4	84.0	125.0	13.375	339.7	9.60	559	170.4
QuickCut	18-5/8	473.1	94.5	42.9	14.000	355.6	4.90	1,165	355.1
QuickCut	20	508.0	133.0	60.3	16.000	406.4	7.60	758	231.0
SAQC	7	177.8	35.0	15.9	5.000	127.0	7.64	750	228.6
SAQC	9-5/8	244.5	53.5	24.3	7.000	177.8	4.40	1,300	396.2
SAQC	10-3/4	273.1	55.5	25.2	8.625	219.1	6.50	880	268.2
SAQC	10-3/4	273.1	65.7	29.8	8.625	219.1	7.50	769	234.4
SAQC	11-3/4	298.5	60.0	27.2	9.625	244.5	6.20	921	280.8
SAQC	13-3/8	339.7	72.0	32.7	11.750	298.5	8.60	667	203.3
Whipback™	7	177.8	26.0	11.8	5.500	139.7	7.20	796	242.6
Whipback	7-5/8	193.7	29.7	13.5	5.500	139.7	6.90	836	254.8
Whipback	9-5/8	244.5	53.5	24.3	7.000	177.8	10.90	522	159.1
Whipback	13-3/8	339.7	72.0	32.7	11.750	298.5	14.76	387	118.0

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Weatherford Dog Leg Severity Calculator Analysis

Analysis Criteria (Junction DLS)

The DLS created by the shallow angle whipstock assembly is first determined by creating an actual layout using the nominal inside diameter of the casing in which the exit is being installed. The QuickCut™ or Shallow Angle QuickCut™ milling assembly is then positioned at the appropriate position to reflect the tested mill path relative to the uppermost location of the window.

Geometry dictates that there is only one (REAL) solution that allows the liner to satisfy the tested geometry constraints that result from the casing and liner geometry and three critical contact points. They are as follows:

- First liner point of contact occurs at a distance generated by the build rate on the outside edge of the liner
- The second point of contact will occur along the inside face of the liner with the upper end of the window, a highly repeatable feature of all QuickCut™ and Shallow Angle QuickCut™ milled windows
- The third point of contact occurs toward the bottom of the milled window on the outside edge of the liner. Proper milling practices will result in a repeatable window regardless of casing grade or formation properties

This approach has been lab tested and field proven assuring that both the equations and layouts support the charted data. This field proven data represents the largest OD ran through the junction (the completion liner) to determine the resulting DLS. Please note that the calculated DLS in the chart above is of that specific liner OD, installed in that specific parent bore casing through that specific milled window profile.

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